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ABSTRACT

These guidelines are divided into three short papers: (1) critique of a research article; (2) critique of a conceptual article or chapter; and (3) construction of a research report. Research articles published in educational psychology journals should be organized, and critiqued, according to the following topics: title; problem area; method; results; discussion and conclusions; and implications for research and education. Procedures for evaluating a conceptual article or a review of research involve: summarizing the article; organizing the critique (according to the author's major points, use of arguments and evidence, flaws or strengths, and resolution of the issue); and editing and rewriting. Before writing a research report, the author should select the hypotheses and the dependent and independent variables. Sections to include when writing the report are: title and name; abstract; problem; hypotheses; method; results; discussion; conclusion; and references. (GDC)

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RESEARCH REPORTS

critique & construction

3 papers prepared for educational psychology students

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RESEARCH REPORTS: CRITIQUE AND CONSTRUCTION.

THREE PAPERS PREPARED FOR EDUCATIONAL PSYCHOLOGY STUDENTS.

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1979.

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PAPER I: CRITIQUE OF A RESEARCH ARTICLE

INTRODUCTION AND OUTLINE

Most of the research information you will be reading is presented as research articles in journals. The educational psychologist needs to develop the basic skills of reading and critically evaluating such research reports.

Journal articles usually follow the format presented in the outline. Use the outline to structure your own critical evaluation. Your critique should cover the eight points in the outline. This organization roughly follows the construction of a journal article and therefore it should be possible to identify the author's attention to these details.

FIGURE I: 1

CRITIQUE OUTLINE

1. TITLE

2. PROBLEM AREA
   a) Problem area
   b) Argument
   c) Review
   d) Hypotheses

3. METHOD
   a) Sample
   b) Design
   c) Procedure
   d) Controls
   e) Replicability

4. RESULTS

5. THE RESEARCHER'S DISCUSSION AND CONCLUSIONS

6. IMPLICATIONS FOR RESEARCH AND EDUCATION

7. YOUR GENERAL COMMENTS AND SUMMARY EVALUATION

A. ATTACKING THE TASK:

Read the article through once briefly for its general sense, then read again following the outline and identifying the sections of the outline.
Familiarize yourself with Sections B to D of this paper, de Cecco (1968, 700-727), and Rest (1975). Make sure that you have a working knowledge of concepts and procedures that should be identifiable in any research study.

Now re-read the article attending carefully to each of the topic areas. Make notes as you proceed, write up an outline of your critique (3-4 pages), then re-read the article once more before your final draft. You may have missed some points. Your critique should be concise but penetrating in its criticism of the study. We're not interested in flowery and padded prose. Your job here is to develop skills for criticizing research articles.

B. CRITIQUE FORMAT

1. TITLE AND AUTHOR (Author, Name of Study, Reference)

   Check the School Manual for conventions.

2. THE PROBLEM AREA

   a) Identify the problem addressed: (i) in general and (ii) re the study's particular focus. e.g. the relation of modeling to learning social behaviours, in particular to the learning of sex-role stereotypic behaviours in boys (= theoretical perspective and general behaviour area, and the particular focus of the study).

   b) Reveal the structure of the author's argument. The problem section should lead logically to the hypotheses. Does it? Is the argument plausible? Do the references to other studies indicate that this one is a necessary or useful project?

   c) There should be a brief review of earlier research in relation to b). You need not chase other research here, but if you were planning to work in this area you would investigate the prior research and the author's use of it, and his/her omissions of significant studies.

   d) State the hypotheses of the study very briefly. Are all tested in the results section? Are some analyses made without stated hypotheses? For example, sometimes you will find that a researcher has not made specific hypotheses about sex differences but has analysed male Vs female responses. Each hypothesis should be accompanied by a specific analysis of the data, and each piece of analysis should be related to a particular hypothesis.

3. METHOD

a) Sampling

There are two considerations related to the use of a sample:

(i) How was the sample selected, and (ii) how is it reported?

(i) On what basis was the sample selected? Randomly? No indication? How were subjects assigned to groups?

(ii) Is the sample adequately described in terms of age, intelligence, sex, school grade, socio-economic status and other variables which may be pertinent to the study? Consider the nature of the sample and describe the characteristics of the population to which findings of the study conceivably could be generalised.

b) Design

Draw up a matrix, or describe in words, the design of the study. This involves identifying dependent variables (the target variables) for measurement and independent variables (the manipulation factors).

THE INDEPENDENT VARIABLE is the factor that is varied or manipulated.
An independent variable may be either:

(a) a treatment variable which is manipulated, eg IV_1 Group I: Female teacher's classroom and Group II: Male teacher's classroom.

or (b) a subject group characteristic (variable)
eg IV_2 age (Group I: 10 year olds, Vs Group II: 20 year olds);
eg IV_3 sex (Group I: females Vs Group II: males)

THE DEPENDENT VARIABLE is the factor hypothesized to be influenced by the manipulation of the independent variable.

In Example IV_1 the Independent Variable was Group I: Female teacher's classroom Vs Group II: Male teacher's classroom.

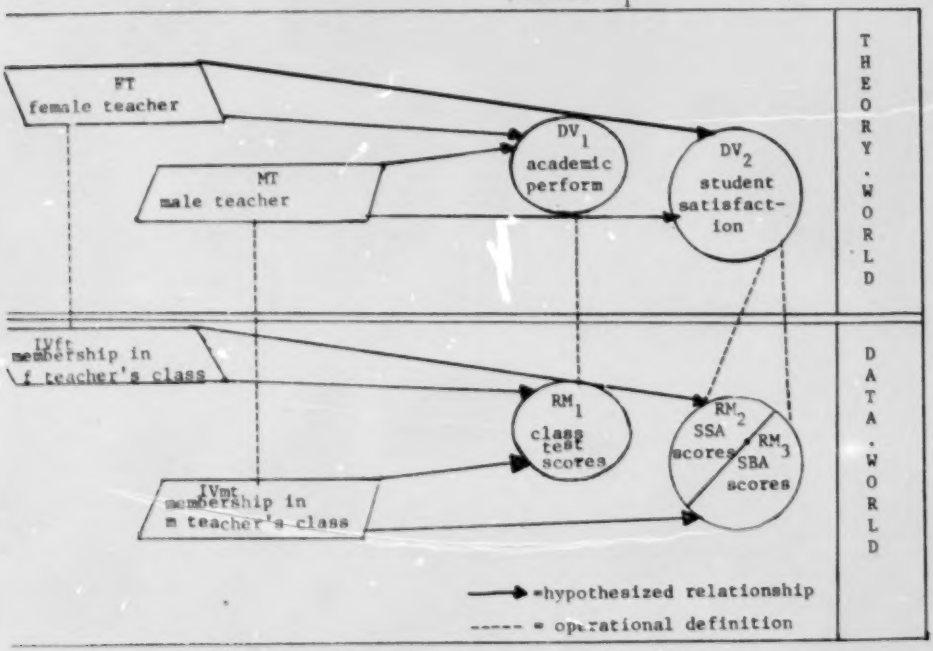
Let us suppose that we are the researchers and we're interested in the children's level of academic performance, and in the children's general satisfaction with class.

We may decide to use each student's performance on a standard class test for an indicator of academic performance. Note that we could have devized a special test, or used some other indicator of academic performance. We may choose to measure general satisfaction with class on two instruments:

FIGURE I:1 is a diagram showing the relationship between the independent and dependent variables we have hypothesized to be related, and the treatments and measures we have used to test that hypothesized relationship.

> QN: What is the influence on girls and boys of being members of a female teacher's class Vs. being members of a male teacher's class?

FIGURE I:2. INFLUENCE OF FEMALE VS MALE TEACHER ON STUDENT ACADEMIC PERFORMANCE & STUDENT SATISFACTION. (EXAMPLE IV_1).



EXERCISE: Complete the diagram in Figure I:2 by inserting an arrow to show where the inference is made. Check your answer in Figure I: 2(a) in the final exercise section.

By operationalizing the concepts and relations of the theory world with empirically workable variables and relationships, the researcher can test the relationship between (IV):I membership in a female teacher's classroom IV(ft) Vs II membership in a male teacher's classroom IV(mt) and performance on the class test (response measure 1); and scores on SSS (response measure 2) and SBA (response measure 3). On the basis of the data analysis, inferences will be made about the relationship between the influence of being in a female class (FT) Vs a male teacher's class with reference to academic performance and student satisfaction.

The degree of confidence one gives to the researcher's inference will be related to:

(a) the adequacy of the operational definitions, e.g. does the SSS provide a valid and reliable measure of student satisfaction?

b) the degree of control exercised to ensure that it was the independent variable which provided influence on the dependent variable, e.g. were the teachers of comparable teaching experience and ability.

c) Procedure

Outline the author's procedure very briefly ; point form is fine. What did she/he Do?

d) Controls

Does the design allow for the control of factors or variables which could affect the dependent variable if left uncontrolled? Identify any relevant factors which are not controlled or are insufficiently controlled. Briefly outline a means by which these factors (if any) could be controlled. Identify some of the factors which are controlled. How are they controlled? Why is it necessary that these factors be controlled?

Can this procedure be criticised in any respect? If your answer is 'yes', briefly outline the criticisms, and suggest ways in which the measuring procedure could have been improved.

e) Replicability

A study should be reported in such a way that you could replicate (repeat) the study.

You may want to: repeat it as a check on the researcher's work; or repeat the design with a different sample; or vary selected aspects of the study.

Is the study replicable? Why? Why not? Attend to sampling and control procedures for clues. Is there sufficient detail to allow replication?

4. RESULTS

The results section should include presentation of statistical results, tables and figures. Does the text agree with the presentation of numbers in the tables, and the illustrative material in the figures?

What are the statistically significant results of the study? Summarize main results briefly in point or table form.

Make sure that you know the meaning of a statement like "The result is significant ($p < .02$)". When a probability level (eg. $p < .02$) is given, it refers to statistical significance $p < .02$ means that the probability of obtaining this result by chance is less than twice in a hundred trials.

5. THE RESEARCHER'S DISCUSSION AND CONCLUSIONS

a) Do the results confirm or disconfirm the hypotheses? (In your answer relate each result to the appropriate hypothesis. This will require an abbreviated restatement of the hypotheses).

b) What conclusions are drawn by the experimenter on the basis of his/her findings? Do you consider that these

are justified i.e. warranted by the results; or, has the experimenter drawn unjustifiable conclusions? For example the operational definitions may have been very poor measures of the theoretical concepts.

c) Does the experimenter consider alternative explanations for the results of his/her study? If not, could a suitable alternative explanation be suggested?

e.g. 'it was possibly the result of biassed sampling procedures, or controlled factors, like experimental prompting or expectations.

Perhaps another theory explains data with greater plausibility.

There is always the possibility of an alternative explanation. For instance, the female teacher in our example may have been an expert teacher and the male teacher may have been a novice teacher.

6. Implications for further Research and Education

Does the researcher indicate lines of future research which are suggested by the study? If so, do you consider that such research would be of worthwhile significance in the area of enquiry? Why? Could a future research topic arising from the study be suggested even if research hasn't mentioned the possibility?

Is this study theoretical or applied in nature? In the light of this question, do the findings hold implications for practice in education, the home, or any setting in which child development is of concern? If so, would any reservations be advisable regarding practical application of the findings? If you consider that the findings do not hold implications for practical application, briefly outline reasons. (de Cecco (1968) may be useful in answering this question).

Be brief here.

C. *GENERAL COMMENTS*

Scope is available here for discussion of any aspects of the study you may wish to mention which were not allowed for in the above format. For example:

- Are there any underlying value assumptions in the study? If so, what are they?
- Ethical Implications. Were the subjects exposed to any ethically questionable practices, e.g. unnecessary stress or deception?
- Formulate your opinion concerning the value of the study. Is it a meaningful, useful contribution?

Again, be brief here.

REFERENCES

de Cecco, J.P. The psychology of learning and instruction: psychology, New Jersey Prentice-Hall, 1968, 703-727.

Kerlinger, F.N. Foundations of behavioural research. New York: Holt, Rinehart & Winston, Inc. 1964.

Rest, J.R. Nifty questions to ask of any study. (general all purpose, all weather indoor-outdoor guide to critiquing studies). Unpublished manuscript, University of Minnesota, 1975.
In E441: Course Materials, 1979.

EXERCISES

WRITE OUT YOUR OWN EXPLANATION OF THE FOLLOWING

Independent variable

Dependent variable

The two aspects of sampling

Operational definitions of theoretical concepts

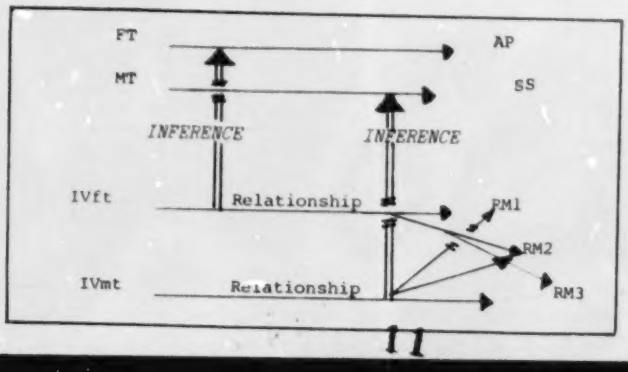
Give a example of how you could provide operational definitions for the hypothesis that:

Feminist teachers provide better academic models for adolescent girls than "traditionally feminine" teachers.

GO BACK AND RE-CHECK YOUR ANSWERS AGAINST THE MATERIAL IN THE TEXT OF THE PAPER.

Answer to Exercise on Figure I: 2.

FIGURE I: 2(a).



PAPER II: CRITIQUE OF A CONCEPTUAL ARTICLE OR CHAPTER

INTRODUCTION AND OVERVIEW

Conceptual papers and review articles are important sources of information for the educational psychology student. Review articles provide a useful means of entry to a research literature. The serious student will want to grasp and evaluate the arguments contained in conceptual position papers. This paper is designed to help you organise your reading and evaluation of papers that depend on argument rather than on reporting empirical studies. Your critique of a conceptual paper should cover the points outlined in the Overview.

FIGURE II: OVERVIEW OF CRITIQUE PROCEDURE

I. SUMMARIZE the article briefly setting out main headings and sub-points and noting special points of interest or for criticism.

II. ORGANISE YOUR PAPER following a format similar to the following outline:

a) Summary of the article's theme and the author's major points.
b) Author's use of argumentation and/or evidence.
c) Critical flaws or strengths.
d) Resolution of the issue.
e) Your final evaluative statement.

III. EDIT AND REWRITE your paper and provide a reference list.

A. *ATTACKING THE TASK:*

1. BEFORE WRITING - SUMMARIZE the article:

- Determine the author's theme and argument
- Make a summary of the argument; its main points, and how it is constructed
- Set out the author's argumentation or evidence base for the claims s/he makes
- Note potential flaws in the argument or in the use of evidence: note these for special attention later
- Be careful not to accept the author's construction or points uncritically

THINK through your own ideas on what you have summarized. You may wish to refer to some other articles or readings from this or other courses.

2. WHEN WRITING YOUR PAPER:

i) Organise your paper carefully.

Use headings if you wish. Here's one way you could organise your material.

FIGURE II:2 OUTLINE OF A CONCEPTUAL CRITIQUE.

Introduction - Your aim and how you intend to fulfill that aim.
Summary - of the author's theme and the author's major points.
Author's use of argumentation and evidence
Critical flaws or strengths - with your argumentation and evidence.
Final statement - fulfilling your aim and your Summary.
Evaluation and position.

ii) SOME IMPORTANT FEATURES TO INCLUDE:

- A summary of the author's theme, points and means of supporting his/her central claims, either by argument or evidence, or both.
- Your critical evaluation of the theme, argument(s), and evidence.
- If the paper has a data-base, examine the evidence presented, i.e. the data as reported by the author, and its value from a research perspective (use of data, methodology, etc.), and evaluate the relevance of the data for the author's claims.

B. *CRITICALLY EXAMINING THE MAIN POINTS IN THE AUTHOR'S ARGUMENT (one or two main ideas).*

1. This critical examination should include:

- Stating the author's position.
- Examining the assumptions on which the argument is built, and the flow of the argument. Ask if the argument is reasonable and if the points follow each other logically.

- Constructing an opposing case. For example, you may wish to argue against the author's position from another theoretical viewpoint: eg. a Behaviourist's criticism of a Piagetian assumption or argument.

- Decide if the author's position will stand up under criticism. You may wish to say that neither of the opposing views provide a completely adequate answer to the problem at issue.

2. INTRODUCE ANY OTHER PERTINENT INFORMATION OR EVIDENCE:

This information may come from course readings, or from class, from your own reading, or from carefully applied personal evidence or argumentation.

Be careful - opinions are of little use, but carefully constructed arguments are of great value
- beware of using unsupported anecdotes - better not to use at all than to use indiscriminately.

Be sure to reference anyone else's material that you use.
eg. John Smith (1975) with full details in bibliography. (See School Manual).

3. Some points to keep in mind:

- Keep to the topic in hand. You are critiquing the article, not telling your life story, or riding your favourite hobby-horse, or writing the great Australian novel.

- Be incisive in your criticism - one well-thought and carefully expressed critical point is worth pages of loose padded opinions.

- Make some final evaluation. Not 'it's good' or 'I disagree with the author, but present an evaluation based on the value of the article to psychology and/or education, and the reasons for value-rating, eg. "this article is valuable for x,y,z or because of a,b,c.".

C. *POLISHING AND FINISHING THE PRODUCT*

When the paper is written, EDIT IT AND RE-WRITE IT.

- Clean up the construction, expression.
- Cut it down where possible.
- Take out the padding.
- Centre on clarity and tightness of the argument.
- Imagine how the original author would criticise your critique of his/her work, and anticipate and counter his/her points.
- Strengthen your weaker points
- Title the paper, and add the bibliography.

D. VARIATIONS AND OTHER USES OF THIS FORMAT

This paper provides a suggested means of constructing a short critique. There will be variations, depending on the type of the article under review. Some papers will require that you pay more attention to the use of data, e.g. review papers, others will require careful attention to the author's assumptions and claims, eg. theoretical position of papers.

The summary in Step A(2) and the outline in FIGURE II.2 may provide a useful system for reviewing conceptual material either for exams, or for filing for future reference.

You may want to consult some of the book reviews in a journal such as Review of Educational Research or the Harvard Educational Review for examples of critical reviews.

PAPER III. CONSTRUCTION OF A RESEARCH REPORT

INTRODUCTION.

Writing Empirical Reports.

Clear, concise and informative reporting of research work and results is as important as obtaining useful data. Without clear reporting, the data of your study remains private, unexamined information. Well reported, even a small scale study can add to the public body of knowledge. It is appropriate for educational psychologists and educational practitioners at all levels to master the art of report writing. Various government (and other) bodies will support and fund studies by school teachers, adult educators and for informal education projects. The student of educational psychology should be able to compile and present a report of his/her research work

FIGURE III:1 OVERVIEW OF FORM FOR RESEARCH REPORT

A. PREPARING FOR THE STUDY.

Decide on:
- a. Hypotheses
- b. Independent and Dependent Variables
- c. Study

Review prior research

B. FORMAT OF THE REPORT (Sections to cover).

1. Title and name
2. Abstract
3. Problem
4. Hypotheses
5. Method
   - a. Design
   - b. Subjects
   - c. Instruments and Materials
   - d. Procedure
6. Results
7. Discussion
8. Conclusion
9. References

A. *PREPARING FOR THE STUDY*

1. Before you start you will need to decide:

   - What hypotheses you are going to test. What do you want to know from your study? What do you predict will be the outcome of the study?
   - What other people have already found out about the topic, i.e., you will need to review the relevant research literature.
   - How you'll do it. What people, materials and situations will you use?
   - How you'll analyse your findings e.g. count of frequencies of responses, comparisons of group averages, etc.

2. Decide on your hypothesis: the statement of relationship between independent and dependent variables which you will test.

   Refer to Figure I:2 (page 4.) which describes the relationship of an empirical study to theoretical concepts. You will be interested in a theoretical concept, such as reading training. In order to examine that empirically you need to design a study which lets you test the effects of a programme of training on reading performance.

   Draw up a matrix of the independent and dependent variables.

   Independent variable = what you'll vary or manipulate.
   Dependent variable = what you're interested in measuring. You will choose response measures with which to measure the concept/variable of interest. (See Paper I, pages 3,4) and Kerlinger (1973,35-46).

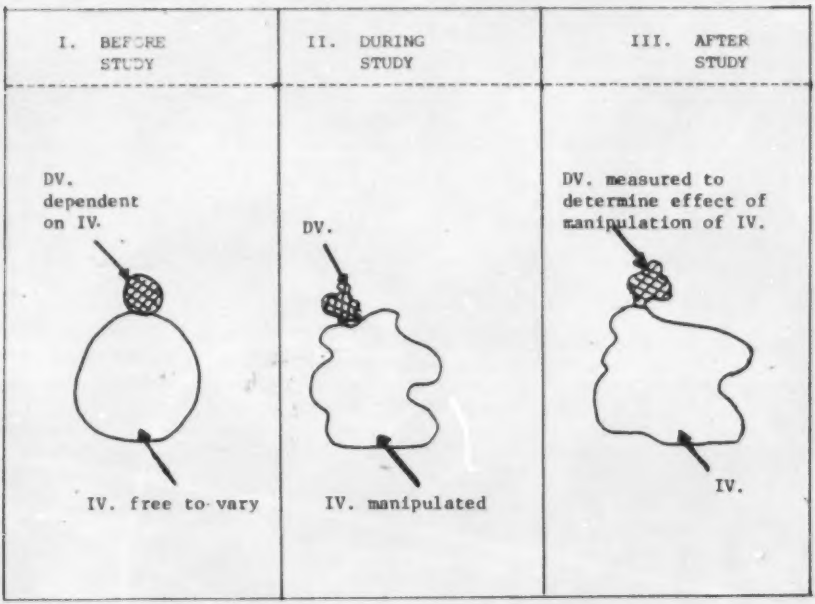
   Example - If you were testing the effects of reading Training you may use a design similar to the one in Table III:1.

   TABLE III:1 MATRIX FOR DESIGN OF A STUDY TO TEST THE EFFECTS OF READING TRAINING ON READING ABILITY.

		DEPENDENT VARIABLE READING ABILITY		
		Response Measures: I Score on timed test (TRT)	II Score on graded reading Scale of chosen books (RSCB)	
INDEPENDENT VARIABLE TRAINING	GROUP I EXPTAL trained readers	$\bar{x}$ Score on TRT	$\bar{x}$ Score on RSCB	N = 20
VS				
NO TRAINING	GROUP II CONTROL no training	$\bar{x}$ Score on TRT		N = 20
				N = 40 subjects

3. Stop and re-check your grasp on the functions of the independent and dependent variables of a study.

FIGURE III: 2. RELATIONSHIP OF INDEPENDENT AND DEPENDENT VARIABLES.



EXERCISE:

Draw up an example of the relationship between independent and dependent variables as Figure III: 2(a). Either use the example in Table II: 1 or use a study you're reading and check from the author's report.

NB. In some studies, especially developmental studies, age and/or school year is used as I.V. The I.V. is varied by using different levels.

For example

IV. AGE LEVEL	Group 1 =	14 yr olds.
	Group 2 =	8 yr olds.
	Group 3 =	2 yr olds.

4. Choose the subjects, materials, treatment, test instruments, setting that will allow you to put your hypothesis to the most rigorous test.

5. Review earlier research and decide if it leaves your questions unanswered and the specific unanswered question. If the question is answered satisfactorily STOP and do a different study.

B. *PRESENTING YOUR REPORT*

After you have conducted your research, plan the report. The following sections should be included.

1. Title, Name and Data. The title describes concepts of your study briefly, with your name and affiliation (university, class).

   Check APA Publications Manual, or School Manual for conventions for referencing.

2. Abstract. A one paragraph statement (100 words) statement with a concise description of the problem, sample, method of investigation, findings and main conclusion. "The thing in a nutshell".

   Your reader should see at a glance what it was all about and decide if she/he wants to read on.

   See Psychology Abstracts or Child Development Abstracts for the general idea.

NB. Leave writing the abstract until you have written the rest of your report.

3. Problem Section

   State the central problem. Give your reasons for asking the questions you ask, i.e., reasons from theoretical concerns, and those prompted by your reading of other researcher's findings or lack of findings. The question should guide your report. The whole study is designed to provide an answer to your burning question. The problem section should lead logically into your specific hypothesis(es). Set out your problem section in point form, then build it into a concise, convincing case for doing your study.

An example. (shorter than your's will be) but an example of a skeletal structure of a problem section.

State the central problem

"Do children enjoy excursions to Murdoch University?"

Give reasons for asking the question

- state theoretical interests
- review previous research
- make an argument for asking the question, and for your specific hypothesis.

Education psychologists have become interested in the way children think about universities. It is felt by some that professors should investigate the circumstances under which 9 year olds would be comfortable on a university campus. Jones & Jones (1900) have argued that successful visits to university campuses by 9 yr. olds will favourably influence community attitudes. Smith and Smith (1901) have argued that favourable attitudes are related to the conditions of particular visits. Didache (1978) claims conditions are not important. Blobbs (1894) found that hungry poor-house children enjoyed the visit to Murdoch, Cockney (1986) found that London convict children did not enjoy the visit. These data suggest the need to look at the conditions of any university visit (Blow, 1977).

There has been no research in which subjects' level of hunger and comfort has been varied. Gourmet (1968) had shown that hungry children preferred a visit to the doctor's if he supplied hamburgers after the examination.

It was decided to examine how well children enjoyed a visit to Murdoch University when their hunger and comfort levels were varied.

EXERCISES:

1. Draw up a design matrix for the "Murdoch Visit" study used as an example in this paper.

   Identify the independent variable (= children's enjoyment). See 5(c) for a hint.

2. Practise constructing: a design, hypothesis(es) and procedure to test this question.

   "Do older women students benefit more from university than younger men?".

   Be careful to translate those general terms into manipulable, controllable, or testable variables, eg. "older women", "benefit from", "young men". Age definitions? Word meanings? Refer to Figure I: 2. (page 4.) for a key for the development of operational definitions.

3. Make up some results and practise presenting them in Tables and graphs.

4. Hypothesis(es)

"It was hypothesised that....."

The hypothesis is a statement of the relationship between the Independent Variable and the Dependent Variable.

i) It was hypothesized that 9 yr. old previously hungry children who were fed on campus would enjoy a visit to Murdoch University more than 9 yr. old hungry, uncomfortable children; and more than a random sample of satisfied school children (Control Group).

ii) It was hypothesized that the control group children would enjoy the visit to Murdoch University more than 9 yr. old hungry uncomfortable children.

5. Method Section

The method describes the design, materials and subjects. Someone reading the report should be able to replicate your study. i.e. re-do what you did from your description. That requirement doesn't mean lengthy, wordy prose, but short, simple (but complete) descriptions.

Journal editors will not accept long, padded articles and examiners usually become very tired when marking them , and.....(?)

a) Design

Draw up your matrix. Explain independent and dependent variables.

b) Subjects

Report how your sample was selected e.g. randomly, or all of Year 4 children at the prison school.

Describe the sample i.e. number, average age, SES, or any other pertinent information.

Your reader should be able to choose another sample from the same population.

c) Instruments and materials e.g. lunch table, chains, dungeon the M.U. Smile Indication Test, the Thank You Monitoring Machine. You may want to give an example, or the instructions in an appendix.

d) Procedure.

Give a concise, step-by-step report of what you did. Your reader should be able to re-trace your steps. Mention how you controlled for any extraneous or nuisance factors which could have influenced your results. For example, time, place, experimenter bias.

6. Results Section

State the findings referring to results of statistical tests and probability levels where appropriate. If using descriptive data only (tables and figures, no stats) report these.
First state findings.
For example:
"Group I enjoyed the visit more than Group II. Group III (C) enjoyed the visit more than Group II.
Then refer to stats and/or tables", i.e. words and tables.
Then give brief summary.
Cover all hypotheses and only those. If you do extra comparisons, you should have hypotheses e.g. sex differences.
Label tables and figures carefully. You may put RAW DATA in Appendices, i.e. scores of individuals in the groups.

7. Discussion Section

Re-state hypotheses briefly and say if supported or not. Discuss and interpret the findings: Describe, explore, explain, (all briefly); and refer to other studies. Suggest alternative explanations. Beat your critics to the gun, and argue for your interpretation. Describe constraints, e.g. two children in Group II stole food from Group I, skewing the results.

8. Conclusions Section

Your conclusion should be a very brief summary statement, with implications for further research education, etc. (Don't go overboard here! Be modest in changing the world!)

9. References Section

All books articles, personal communications mentioned in the text must be referenced fully in the Reference List. (Refer to conventions in School Manual).

Attach figures, tables (if not throughout Text). Usually instruments and tabulated raw data are attached as Appendices.

REFERENCES:

Kerlinger, F. Foundations of Behavioural Research: New York: Holt, Rinehart and Winston, 1973, 2nd. Ed.

Straton, R.G. and Lawrence, J.A. "E 241 Processes of Learning, Laboratory Report Handout, 1979".